

New Patent Claims:

1. A molding with synthetic polymer surfaces which have self-cleaning properties and have surface structures with elevations, characterized in that the elevations are formed by particles which have been securely bonded to the synthetic polymer surface and which have hydrophobic properties, the particles having been bonded directly into the synthetic polymer surface, rather than having been bonded by way of carrier systems or the like.
2. The molding as claimed in claim 1, characterized in that the elevations have an average height of from 50 nm to 25  $\mu\text{m}$  and an average separation of from 50 nm to 25  $\mu\text{m}$ .
3. The molding as claimed in claim 1 or 2, characterized in that the elevations have an average height of from 50 nm to 4  $\mu\text{m}$  and/or an average separation of from 50 nm to 4  $\mu\text{m}$ .
4. The molding as claimed in any of claims 1 to 3, characterized in that the elevations have an aspect ratio of from 0.5 to 20.
5. The molding as claimed in claim 4, characterized in that the elevations have an aspect ratio of from 1 to 10.
6. The molding as claimed in any of claims 1 to 5, characterized in that

the elevations have been applied to the inner surface of the moldings.

7. The molding as claimed in any of claims 1 to 6,  
5 characterized in that  
the elevations have been applied to the outer surface of the moldings.
8. The molding as claimed in any of claims 1 to 7,  
10 characterized in that  
the synthetic polymer surface of the moldings comprises a material selected from poly(trifluoroethylene), poly(vinylidene fluoride), poly(chlorotrifluoroethylene), poly(hexafluoropropylene),  
15 poly(perfluoropropylene oxide), poly(fluoroalkyl acrylate), poly(fluoroalkyl methacrylate), poly(vinyl perfluoroalkyl ether), or comprises other polymers from perfluoroalkoxy compounds, poly(isobutene), poly(4-methyl-1-pentene),  
20 polycarbonates, poly(meth)acrylates, polyamides, PVC, polyethylenes, polypropylenes, aliphatic linear or branched alkenes, cyclic alkenes, polystyrenes, polyesters, polyether sulfones, polyacrylonitrile, or polyalkylene terephthalates,  
25 and polynorbornene, in the form of homo- or copolymer, or comprises a mixture of these.
9. The molding as claimed in any of claims 1 to 8,  
characterized in that  
30 the surface of the particles has an irregular fine structure in the nanometer range.
10. The molding as claimed in at least one of claims 1 to 9,  
35 characterized in that  
the moldings comprise particles selected from silicates, minerals, metal oxides, metal powders, silicas, pigments, or polymers.

11. The molding as claimed in at least one of claims 1 to 10,  
characterized in that
- 5 the moldings comprise particles selected from fumed silicas, precipitated silicas, aluminum oxide, silicon oxide, doped silicates, fumed silicates, or pulverulent polymers.
- 10 12. A process for producing moldings with surfaces, all or part of which have elevations, characterized in that
- 15 a surface of the moldings which is swollen by a swelling agent is treated with this swelling agent, where the swelling agent comprises undissolved particles having hydrophobic properties, and after removal of the swelling agent and drying at least some of the particles are securely bonded to the surface of the
- 20 moldings.
13. The process as claimed in claim 12, characterized in that
- 25 the particles have been suspended in the swelling agent.
14. The process as claimed in claim 12 or 13, characterized in that
- 30 the surface which is solvated by a swelling agent comprises polymers based on polycarbonates, on poly(meth)acrylates, on polyamides, on PVC, on polyethylenes, on polypropylenes, on aliphatic linear or branched alkenes, on cyclic alkenes, on polystyrenes, on polyesters, on polyether
- 35 sulfones, on polyacrylonitrile, or on polyalkylene terephthalates, or else comprises their mixtures or copolymers.

15. The process as claimed in at least one of claims 12 to 14,  
characterized in that  
the swelling agent used comprises at least one  
5 compound suitable as a swelling agent for the  
appropriate surface and selected from the group of  
the alcohols, the glycols, the ethers, the glycol  
ethers, the ketones, the esters, the amides, the  
nitro compounds, the halogenated hydrocarbons, and  
10 the aliphatic and aromatic hydrocarbons, or a  
mixture of these.
16. The process as claimed in claim 15,  
characterized in that  
15 the swelling agent used comprises at least one  
compound suitable as a swelling agent for the  
appropriate surface and selected from methanol,  
ethanol, propanol, butanol, octanol, cyclohexanol,  
phenol, cresol, ethylene glycol, diethylene  
20 glycol, diethyl ether, dibutyl ether, anisole,  
dioxane, dioxolane, tetrahydrofuran, monoethylene  
glycol ether, diethylene glycol ether, triethylene  
glycol ether, polyethylene glycol ether, acetone,  
butanone, cyclohexanone, ethyl acetate, butyl  
25 acetate, isoamyl acetate, ethylhexyl acetate,  
glycol ester, dimethylformamide, pyridine, N-  
methylpyrrolidone, N-methylcaprolactone,  
acetonitrile, carbon disulfide, dimethyl  
sulfoxide, sulfolane, nitrobenzene,  
30 dichloromethane, chloroform, carbon tetrachloride,  
trichloroethene, tetrachloroethene, 1,2-  
dichloroethane, and chlorophenol, or comprises  
(hydro)chlorofluorocarbons, petroleum spirits,  
petroleum ether, cyclohexane, methylcyclohexane,  
35 decalin, tetralin, terpenes,  
hexafluoroisopropanol, benzene, toluene, and  
xylene, or a mixture of these.

17. The process as claimed in at least one of claims  
12 to 16,  
characterized in that  
the swelling agent which comprises the particles  
has a temperature of from  $-30^{\circ}\text{C}$  to  $150^{\circ}\text{C}$ ,  
preferably from  $15$  to  $100^{\circ}\text{C}$ , prior to application  
to the surface.
18. The process as claimed in at least one of claims  
12 to 17,  
characterized in that  
the swelling agent comprises particles which have  
an average particle diameter of from  $0.02$  to  
 $100\text{ }\mu\text{m}$ .
19. The process as claimed in claim 18,  
characterized in that  
the swelling agent comprises particles which have  
an average particle diameter of from  $0.1$  to  $30\text{ }\mu\text{m}$ .
20. The process as claimed in at least one of claims  
12 to 19,  
characterized in that  
the swelling agent comprises particles selected  
from silicates, minerals, metal oxides, metal  
powders, silicas, pigments, or polymers.
21. The process as claimed in at least one of claims  
12 to 20,  
characterized in that  
the particles have hydrophobic properties by  
virtue of treatment with a suitable compound.
22. The process as claimed in claim 21,  
characterized in that  
the particles are provided with hydrophobic  
properties prior to or after bonding to the  
surface.

23. A vessel with a synthetic polymer surface which has self-cleaning properties and has surface structures with elevations, the production process being as claimed in any of claims 12 to 22.
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24. A textile with a synthetic polymer surface which has self-cleaning properties and has surface structures with elevations, the production process being as claimed in any of claims 12 to 22.
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